# HMS lock nuts

Split nuts for easy and simple locking

**NOTE:** This catalogue contains a product description and product data. It also contains mounting and dismounting instructions which need to be read by all personnel before they work with these lock nuts.

# HMS lock nuts

## Design features

HMS lock nuts permit simple, efficient and precise axial location of large-size bearings and other large components on the shaft **(fig. 1)**.

This lock nut features a single split in the ring body and a clamping bolt **(fig. 2)**. When the clamping bolt is tightened, the gap is narrowed and the nut is located without clearance. The nut has a tight fit on the shaft thread so that it cannot turn.

This special feature not only facilitates mounting but also simplifies arrangement design.

## Applications

HMS lock nuts from SKF, which are interchangeable with HM lock nuts, are suitable for various applications (e.g. wind turbines). HMS lock nuts are typically used to:

- axially locate all types of large-size bearings and other large components, or
- secure a withdrawal sleeve with a mounted bearing.

## Benefits

The essential benefits of the split HMS lock nut are as follows:

- No shaft keyways required enabling smaller shaft diameters. Benefits include:
  - less weight
  - lower cost
  - no induced shaft stresses
- Easy to mount, which is especially important where large-size lock nuts are concerned. Mounting and dismounting can be facilitated by expanding the ring body using the clamping bolt.
- Eliminates problem of fretting corrosion when dismounting, as the ring body can be slightly expanded.
- HMS lock nuts can accommodate, to some extent, shaft threads that are out of tolerance.
- The near perfect 360° grip on the shaft virtually eliminates shaft damage and the possibility of fretting corrosion. This, combined with the force exerted on both sides of the shaft thread, keeps the HMS lock nut from working loose.
- Due to its unique locking system, the HMS lock nut can be secured at any point on a shaft.
- Full interchangeability with conventional lock nuts (except for a few sizes). See section, *HMS lock nuts,* on **page 7**.

**Fig. 1**

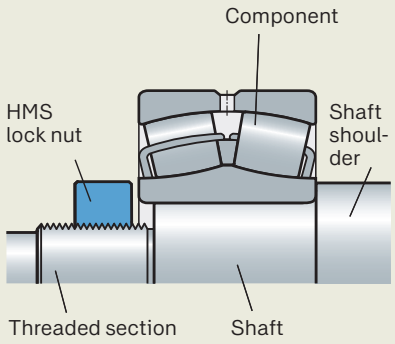
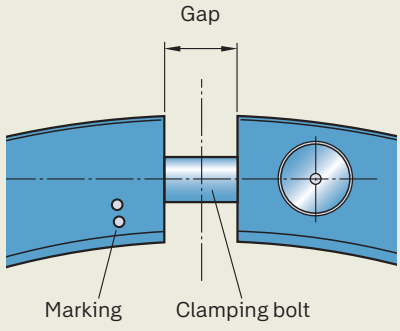



**Fig. 2**



# Assortment

The current range of split HMS lock nuts is shown in **table 2** on **page 7**. Other sizes and special designs are available. For additional information, contact the SKF application engineering service.

# Mounting handle

To facilitate mounting, HMS lock nuts have four to six equally spaced threaded holes on their outside diameter to accommodate the mounting handle supplied with each nut **(fig. 3)**. The threaded holes can also accommodate customer supplied eye bolts.

HMS lock nuts, up to an outer diameter of 900 mm, are supplied with one mounting handle. Larger sizes are supplied with two mounting handles. Eye bolts are not included.

# Extension bar

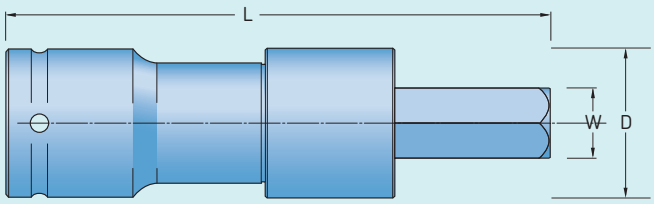
Extension bars, which can be used with a 1/2 or 3/4 inch drive torque wrench, are also available for specific lock nut sizes **(fig. 4)**. The extension bars have a TMFL designation prefix followed by the size **(table 1)**.

On request, HMS lock nuts can be supplied with an extension bar.

Complete HMS lock nut mounting kits are identified by the suffix K. For example, an HMS 30/600 AK kit would consist of the following:

- 1 lock nut HMS 30/600 A
- 1 mounting handle
- 1 extension bar TMFL 19/147.

**Table 1**




| HMS nut designation | | Extension bar designation | Width across flats | Length | Diameter | Drive |
|---|---|---|---|---|---|---|
| from | to | | W | L | D | |
| – | – | – | mm | | | inch |
| HMS 3044 A | HMS 3056 A | **TMFL 10/78** | 10 | 78 | 21,5 | 1/2 |
| HMS 3060 A | HMS 3072 A | **TMFL 12/85** | 12 | 85 | 25 | 1/2 |
| HMS 3076 A | HMS 3084 A | **TMFL 14/100** | 14 | 100 | 29 | 1/2 |
| HMS 3088 A | HMS 30/500 A | **TMFL 14/110** | 14 | 110 | 32 | 1/2 |
| HMS 30/530 A | HMS 30/560 A | **TMFL 17/154** | 17 | 154 | 36 | 3/4 |
| HMS 30/600 A | HMS 30/670 A | **TMFL 19/147** | 19 | 147 | 40 | 3/4 |
| HMS 30/710 A | HMS 30/950 A | **TMFL 24/196** | 24 | 196 | 49 | 3/4 |
| HMS 30/1000 | HMS 30/1500 | *Contact SKF for details* | 24 | – | – | – |

**Fig. 3**

**Fig. 4**

# Mounting and dismounting

## Mounting instructions

### Prior to mounting

1 Never remove the clamping bolt.
2 Check that the threads on the shaft have been produced to an 7e tolerance. See section, *Mating thread,* on **page 6**.
3 Check that the shaft threads have been thoroughly cleaned.
4 To handle the lock nuts, threaded holes are in place that can be used for different fasteners, (e.g. eye bolts).

### Mounting

1 After the component to be located has been mounted, e.g. a rolling bearing, clean and inspect the shaft threads thoroughly. Then apply a light coating of oil **(fig. 5)**.
2 To facilitate mounting, check that the gap width on the lock nut is set to the width **"b"** quoted in **table 2** on **page 7**. Adjust the clamping bolt accordingly.
3 Position the lock nut on the shaft with the unmarked side facing the mating part, preferably using a lifting tackle with spring attachments.
4 Using the mounting handle, screw the lock nut onto the shaft thread by hand until it abuts the component that it is to locate **(fig. 6)**.
5 Check that the lock nut side face abuts the component over its whole surface.
6 Tighten the clamping bolt using a torque wrench and applying the corresponding tightening torque for premounting, listed in **table 2** on **page 7 (fig. 7)**.
7 Mark the relative position of the nut on the mating thread at the position of the "•" marking (**fig. 8**, *marking 1*) using a colour marker **(fig. 9)**.
8 Loosen the clamping bolt in the lock nut until the gap width "**b**" is obtained. Then unscrew the lock nut through a quarter of a turn (approximately 90 degrees).
9 Again hand-tighten the lock nut until the position of the "⁘" marking (**fig. 8**, *marking 2*) coincides with the coloured marking on the mating thread **(fig. 10)**.
10 Tighten the clamping bolt using a torque wrench **(fig. 11)** and apply the corresponding tightening torque for final mounting, listed in **table 2** on **page 7**.
An axial gap will remain between the mating part and the HMS lock nut. This is referred to as calculated residual clearance. See the **Note** below.
11 Remove any mounting aids from the lock nut.

**Note:** Depending on thread size of the HMS lock nut, an axial gap remains between the mating part and the HMS lock nut. This is referred to as calculated residual clearance, listed in **table 2** on **page 7**. This clearance serves to make sure that the HMS lock nut properly engages the mating thread.
However, the HMS lock nut can also be mounted with reduced clearance. In this case, please contact SKF for details.

Should the actual clearance exceed the specified calculated residual clearance, the lock nut must be loosened again and the relative position of the "⁘" marking (**fig. 8**, marking 2) changed. Mounting steps **8** to **11** should be repeated.

Fig. 5

Fig. 6

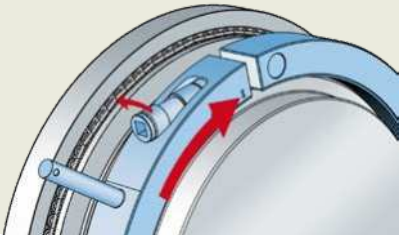


Fig. 7

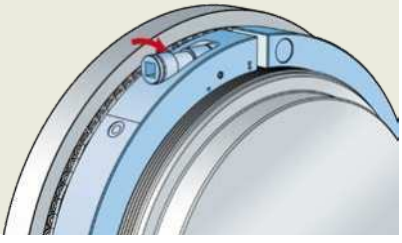


Fig. 8

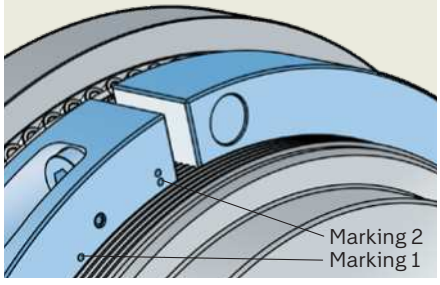


Fig. 9

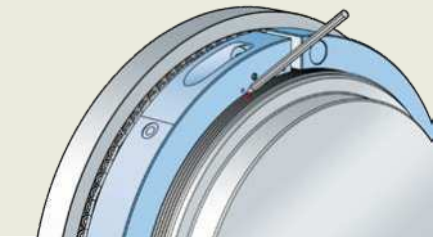


Fig. 10

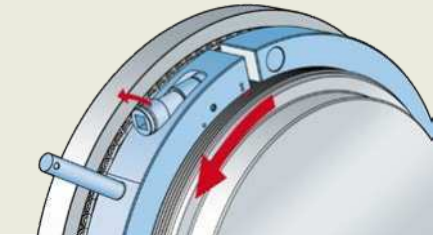
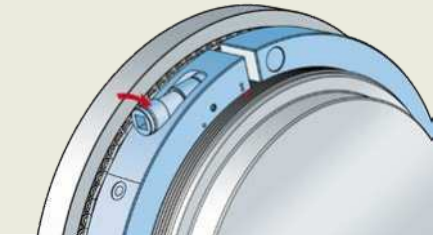


Fig. 11



# Dismounting instructions

1 Clean the exposed shaft threads, making sure to remove any rust or debris **(fig. 12)**.

2 Loosen the clamping bolt in the HMS lock nut until the gap width **“b”** specified in **table 2** on **page 7** is obtained **(fig. 13)**.

3 Unscrew the lock nut by hand using the mounting handle **(fig. 14)**.

4 If the nut is frozen in place, hit around the circumference of the nut with a soft head dead-blow hammer (e.g. TMFT 36 H).
If necessary, loosen the clamping bolt to widen the gap an additional 10 % maximum.

5 Completely unscrew the lock nut from the shaft thread.

Fig. 12

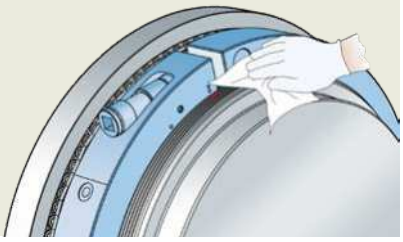


Fig. 13

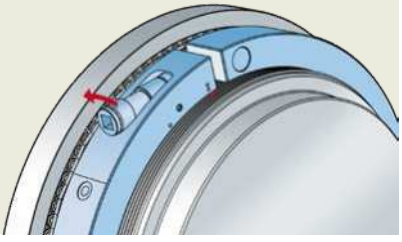
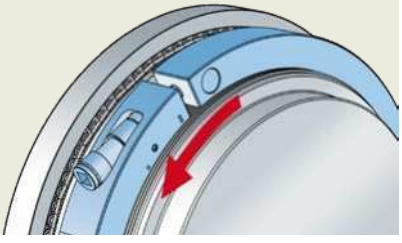


Fig. 14



# Product data

## General data

### Dimensions

The dimensions of HMS lock nuts correspond to those specified in DIN 981:1993 and ISO 2982-2:2001 respectively for lock nuts in the HM 30 series. The dimensions are listed in **table 2** on **page 7**.

### Thread

HMS lock nuts have a metric trapezoidal thread, grade 7H, according to DIN 103-3:1977 and ISO 2903:1993 respectively.

### Mating thread

SKF recommends the mating shaft thread be made to the 7e tolerance class for metric trapezoidal threads as specified in DIN 103-3:1977 and ISO 2903:1993 respectively.

### Material

The steel ring body of HMS lock nuts has a yield strength of at least 305 MPa. The nuts are coated with oil to inhibit rust. To enhance corrosion resistance, HMS lock nuts can be supplied with special surface treatments. For additional information, contact the SKF application engineering service.

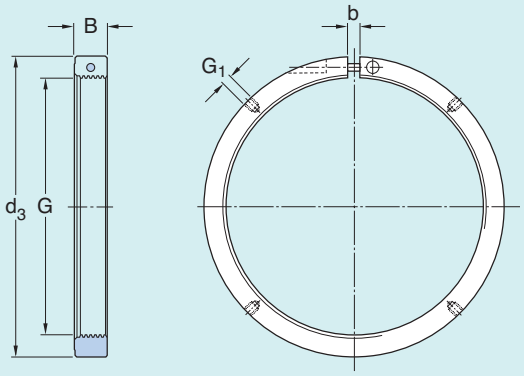
It is also possible to coat the non-contact surfaces of the lock nut with paint or plastic.

Never paint the lock nut threads or the ring side face that abuts the component to be located.

### Storage

HMS lock nuts coated in oil can be safely stored in their original packages for long periods of time. Store HMS lock nuts flat on a shelf, in a room where the relative humidity does not exceed 60 %.

## HMS lock nuts




| Dimensions | | | | | Tightening torque on clamping bolt | | Calculated residual clearance [1] | Mass | Designation |
|---|---|---|---|---|---|---|---|---|---|
| Thread | Outer diameter | Width | Gap width | Thread for mounting lever | for pre-mounting | for final mounting | | | |
| G | $d_3$ | B | b | $G_1$ | $T_t$ | $T_m$ | | | |
| mm | | | | | N·m | | mm | kg | – |
| Tr 220x4 | 280 [2] | 32 [2] | 13 | M 8 | 10 | 80 | 0.22 | 5.9 | **HMS 3044 A** |
| Tr 240x4 | 300 [2] | 34 | 13 | M 8 | 10 | 80 | 0.22 | 6.8 | **HMS 3048 A** |
| Tr 260x4 | 320 [2] | 34 | 13 | M 8 | 10 | 80 | 0.22 | 7.2 | **HMS 3052 A** |
| Tr 280x4 | 340 [2] | 38 | 13 | M 8 | 10 | 80 | 0.22 | 8.7 | **HMS 3056 A** |
| Tr 300x4 | 365 [2] | 42 | 14 | M 10 | 15 | 124 | 0.22 | 11.3 | **HMS 3060 A** |
| Tr 320x5 | 385 [2] | 42 | 14 | M 10 | 15 | 124 | 0.24 | 12 | **HMS 3064 A** |
| Tr 340x5 | 405 [2] | 45 | 14 | M 10 | 15 | 124 | 0.24 | 13.7 | **HMS 3068 A** |
| Tr 360x5 | 425 [2] | 45 | 14 | M 10 | 15 | 124 | 0.24 | 14.4 | **HMS 3072 A** |
| Tr 380x5 | 450 | 48 | 16 | M 12 | 20 | 185 | 0.24 | 17.4 | **HMS 3076 A** |
| Tr 400x5 | 470 | 52 | 16 | M 12 | 20 | 185 | 0.24 | 19.8 | **HMS 3080 A** |
| Tr 420x5 | 490 | 52 | 16 | M 12 | 20 | 185 | 0.24 | 21 | **HMS 3084 A** |
| Tr 440x5 | 520 | 60 | 18 | M 12 | 30 | 265 | 0.24 | 28 | **HMS 3088 A** |
| Tr 460x5 | 540 | 60 | 18 | M 16 | 30 | 265 | 0.24 | 30 | **HMS 3092 A** |
| Tr 480x5 | 560 | 60 | 18 | M 16 | 30 | 265 | 0.24 | 31 | **HMS 3096 A** |
| Tr 500x5 | 580 | 68 | 19 | M 16 | 30 | 265 | 0.24 | 36 | **HMS 30/500 A** |
| Tr 530x6 | 630 | 68 | 20 | M 16 | 40 | 370 | 0.26 | 49 | **HMS 30/530 A** |
| Tr 560x6 | 650 | 75 | 20 | M 16 | 40 | 370 | 0.26 | 52 | **HMS 30/560 A** |
| Tr 600x6 | 700 | 75 | 22 | M 16 | 50 | 505 | 0.26 | 61 | **HMS 30/600 A** |
| Tr 630x6 | 730 | 75 | 23 | M 16 | 50 | 505 | 0.26 | 64 | **HMS 30/630 A** |
| Tr 670x6 | 780 | 80 | 25 | M 16 | 50 | 505 | 0.26 | 79 | **HMS 30/670 A** |
| Tr 710x7 | 830 | 90 | 27 | M 20 | 80 | 850 | 0.32 | 105 | **HMS 30/710 A** |
| Tr 750x7 | 870 | 90 | 28 | M 20 | 80 | 850 | 0.32 | 109 | **HMS 30/750 A** |
| Tr 800x7 | 920 | 90 | 31 | M 20 | 80 | 850 | 0.32 | 116 | **HMS 30/800 A** |
| Tr 850x7 | 980 | 90 | 31 | M 20 | 90 | 925 | 0.32 | 131 | **HMS 30/850 A** |
| Tr 900x7 | 1 030 | 100 | 31 | M 20 | 90 | 925 | 0.32 | 157 | **HMS 30/900 A** |
| Tr 950x8 | 1 080 | 100 | 32 | M 20 | 90 | 925 | 0.38 | 166 | **HMS 30/950 A** |
| Tr 1000x8 | 1 140 | 100 | 39 | M 24 | 50 | 480 | 0.38 | 186 | **HMS 30/1000** |
| Tr 1060x8 | 1 200 | 100 | 39 | M 24 | 50 | 480 | 0.38 | 196 | **HMS 30/1060** |
| Tr 1120x8 | 1 260 | 100 | 39 | M 24 | 50 | 480 | 0.38 | 207 | **HMS 30/1120** |
| Tr 1180x8 | 1 320 | 100 | 39 | M 24 | 50 | 480 | 0.38 | 217 | **HMS 30/1180** |
| Tr 1250x8 | 1 390 | 110 | 40 | M 24 | 50 | 480 | 0.38 | 253 | **HMS 30/1250** |
| Tr 1320x8 | 1 460 | 110 | 40 | M 24 | 50 | 480 | 0.38 | 266 | **HMS 30/1320** |
| Tr 1400x8 | 1 540 | 110 | 40 | M 24 | 50 | 480 | 0.38 | 282 | **HMS 30/1400** |
| Tr 1500x8 | 1 650 | 110 | 40 | M 24 | 50 | 480 | 0.38 | 373 | **HMS 30/1500** |

[1] Tolerance: +/-0.05 mm
[2] Dimensions deviate from conventional HM nuts

Other sizes and special designs are available. For additional information, contact the SKF application engineering service.

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